FURUNO

Installation Manual
COLOR GPS PLOTTER GP-7000

SAFETY INSTRUCTIONS i
SYSTEM CONFIGURATION ii
EQUIPMENT LISTS iii

1. INSTALLATION 1
1.1 Display Unit 1
1.2 Antenna Unit 4

2. WIRING 5

3. ADJUSTMENTS 9
3.1 Choosing Position Data Source 9
3.2 Choosing Port I/O Format 11
3.3 Calibrating NMEA Depth, Speed and Water Temperature Data 13
3.4 Waypoint, Route Format 14
3.5 External Event Format 14
3.6 C-link (primary and secondary stations) 15

PACKING LIST A-1
OUTLINE DRAWINGS D-1
INTERCONNECTION DIAGRAM S-1

FURUNO ELECTRIC CO., LTD.

www.furuno.co.jp

⚠ SAFETY INSTRUCTIONS

⚠ WARNING

ELECTRICAL SHOCK HAZARD
Do not open the equipment unless totally familiar with electrical circuits and service manual.

Only qualified personnel should work inside the equipment.

Turn off the power at the switchboard before beginning the installation.

Fire or electrical shock can result if the power is left on.

⚠ CAUTION

Observe the following compass safe distances to prevent interference to a magnetic compass:

	Standard compass	Steering compass
Display unit	0.70 m	0.45 m

Use the power cable supplied with the installation materials.

Use of other power cables may cause fire or damage the equipment.

Use the proper fuse.

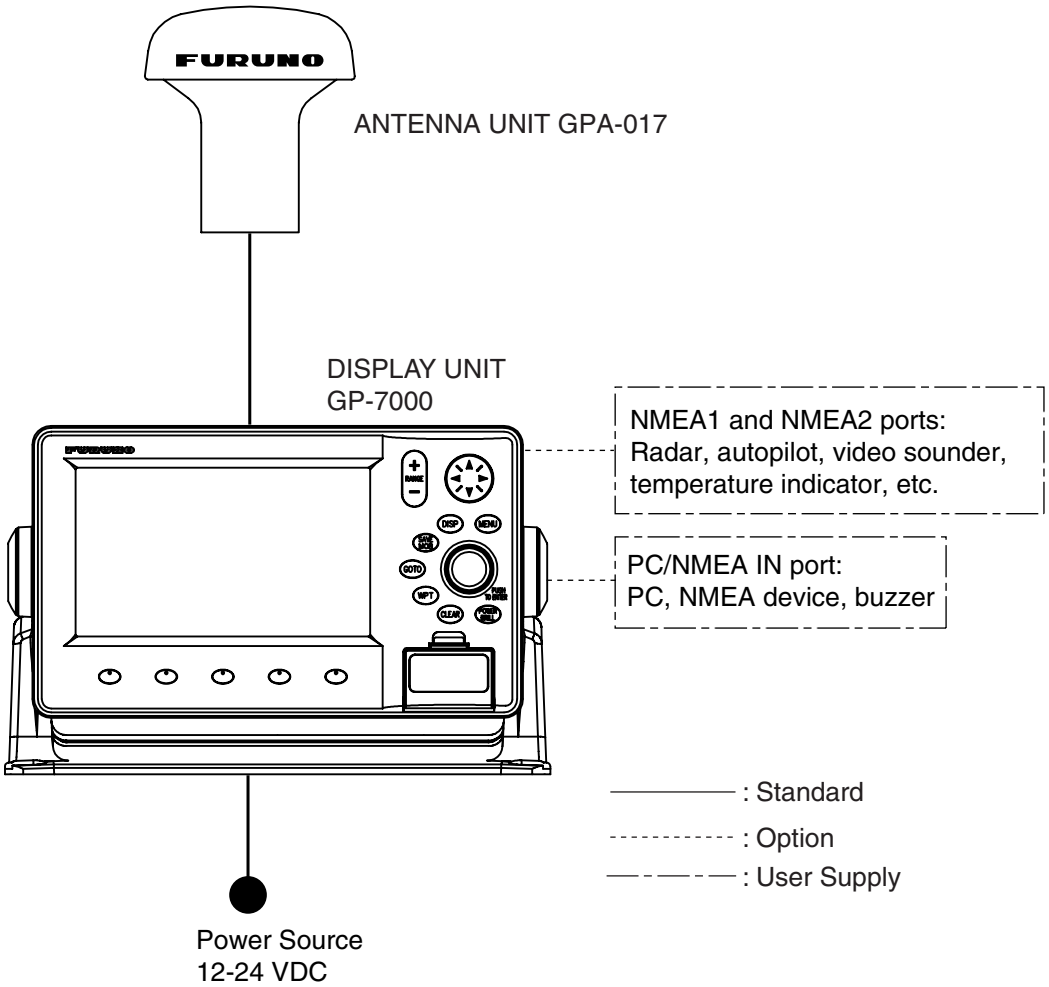
Use of the wrong fuse may damage the equipment.

Organic solvent

Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.

Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

SYSTEM CONFIGURATION



How to remove the hard cover
Place your thumbs at the center of the cover, and then lift the cover while pressing it with your thumbs.

EQUIPMENT LISTS

Standard supply

Name	Type	Code No.	Qty	Remarks
Display Unit	GP-7000	—	1	
Antenna Unit	GPA-017	—	1	System also available without antenna (for boats which already have an appropriate antenna)
Installation Materials*	CP14-06400	000-041-183	1	
Accessories*	FP20-01100	000-042-239	1	
Spare Parts*	SP14-03201	004-371-980	1	

* See packing list at back of this manual.

Optional equipment

Name	Type	Code No.	Qty
GPS Antenna	GPA-017S	000-040-541	
Antenna Cable Set	CP20-01700	004-372-110	30 m, antenna cable extension
	CP20-01710	004-372-120	50 m, antenna cable extension
Right Angle Antenna Base	No.13-QA330	000-803-239	For mounting antenna unit
L-angle Antenna Base	No.13-QA310	000-803-240	
Antenna Base for Rail Mounting	No.13-RC5160	000-806-114	
Mast Mounting Kit	CP20-01111	004-365-780	For mounting antenna unit on a mast
Cable Assy.	MJ-A6SPF0012-050C	000-154-053-10	6P – 6P, 5 m
	MJ-A6SPF0012-100C	000-154-037-10	6P – 6P, 10 m
	MJ-A6SPF0003-050C	000-154-054-10	6P, 5 m
	MJ-A7SPF0007-050C	000-154-028-10	For connecting a PC, 5 m, with 7P connector

1. INSTALLATION

1.1 Display Unit

The display unit may be mounted on a desktop, overhead or flush mounted in a console.

Mounting considerations

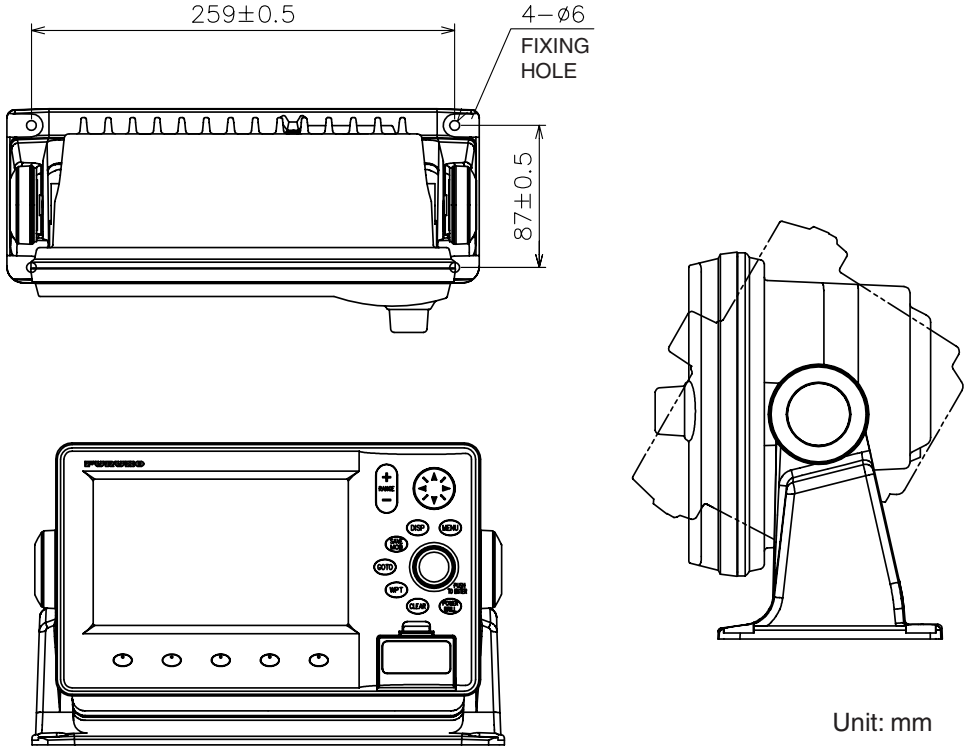
Choose a mounting location for the display unit considering the following points:

- Choose a location where the controls can be easily operated.
- Leave sufficient space around the unit to facilitate checking and maintenance. See the outline drawing at the back of this manual for recommended maintenance space.
- Locate the unit out of direct sunlight because of heat that can build up inside the cabinet.
- The operating temperature range is -15°C to 55°C (5°F to 131°F).
- Locate the unit well away from exhaust gases and other active gases.
- The location should be well ventilated.
- Choose a location where shock and vibration are minimal.
- Be sure the mounting location is strong enough to support the weight of the unit, particularly in overhead mounting. If necessary reinforce the mounting location.
- A magnetic compass will be affected if the display unit is placed too close to the compass. Observe the following compass safe distances to prevent deviation to the compass. Standard compass, 0.70 m, Steering compass, 0.45 m.

Mounting

Desktop, overhead mounting

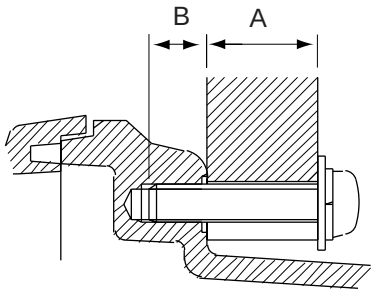
1. Fix the hanger to the mounting location with four self-tapping screws (5X20). See the outline drawing on page D-1 for complete mounting dimensions.
2. Loosely screw the knob bolts into the display unit.
3. Set the display unit to the hanger and tighten the knob bolts.
4. Attach the hard cover to the display unit to protect the LCD.



Display unit, mounting dimensions for desktop or overhead mounting

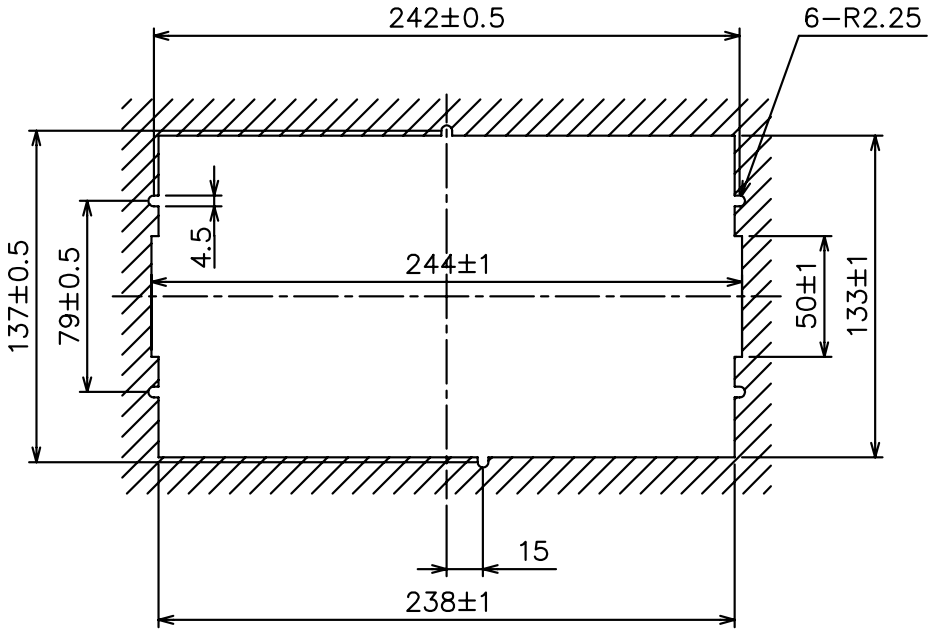
Flush mounting

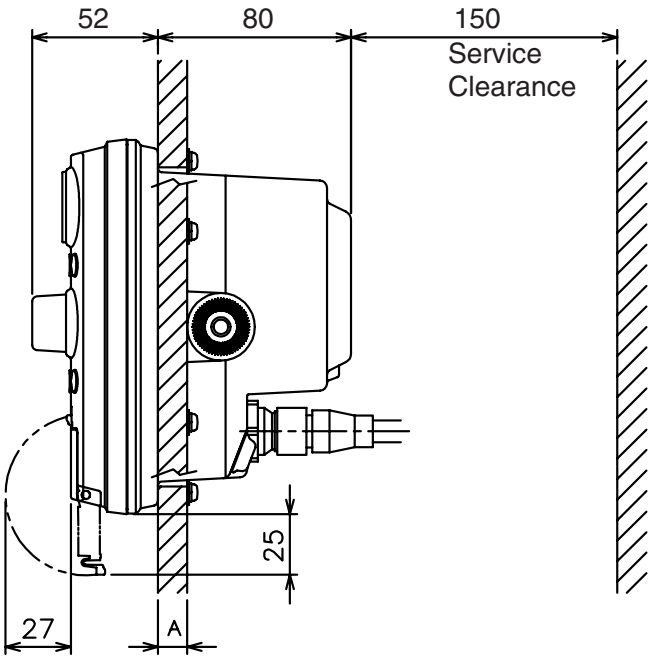
If the thickness of the console is 11-14 mm, use the washer head screws (M4X20) supplied with the installation materials. If it is thicker than those dimensions, the length of the screws should be the thickness of the console plus 7.3 mm ±1.5 mm. The length of the threaded portion to be inserted to the display unit should not exceed 7 mm (B≦7).



A: Thickness of console

1. Prepare a cutout in the mounting location using the template provided.
2. Fix the display unit with six washer head screws (M4X20) provided.





Unit: mm

Mounting dimensions for flush mounting

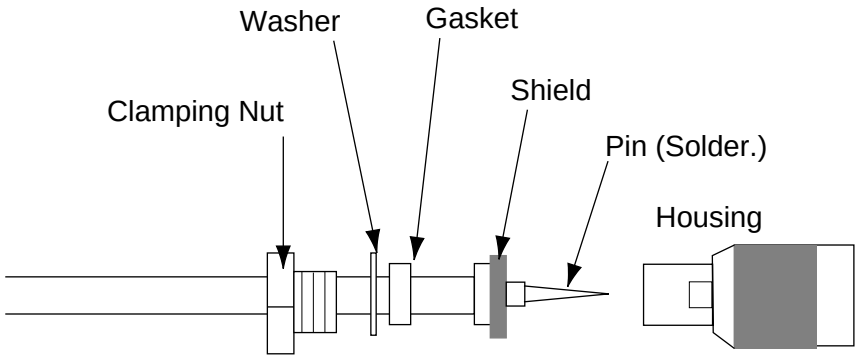
1.2 Antenna Unit

Refer to the antenna unit outline drawing at the back of this manual for mounting instructions.

When selecting a mounting location consider the following points:

- Select a location out of the radar and Inmarsat beams. Those beams will obstruct or prevent reception of the GPS satellite signal.
- There should be no interfering object within the line-of-sight to the satellites. Objects within line-of-sight to a satellite, for example, a mast, may block reception or prolong acquisition time.
- Locate the antenna well away from the antenna of a VHF radiotelephone to prevent interference.
- Mount the antenna unit as high as possible. Mounting it this way keeps it free of interfering objects and water spray, which can interrupt reception of GPS satellite signal if the water freezes.

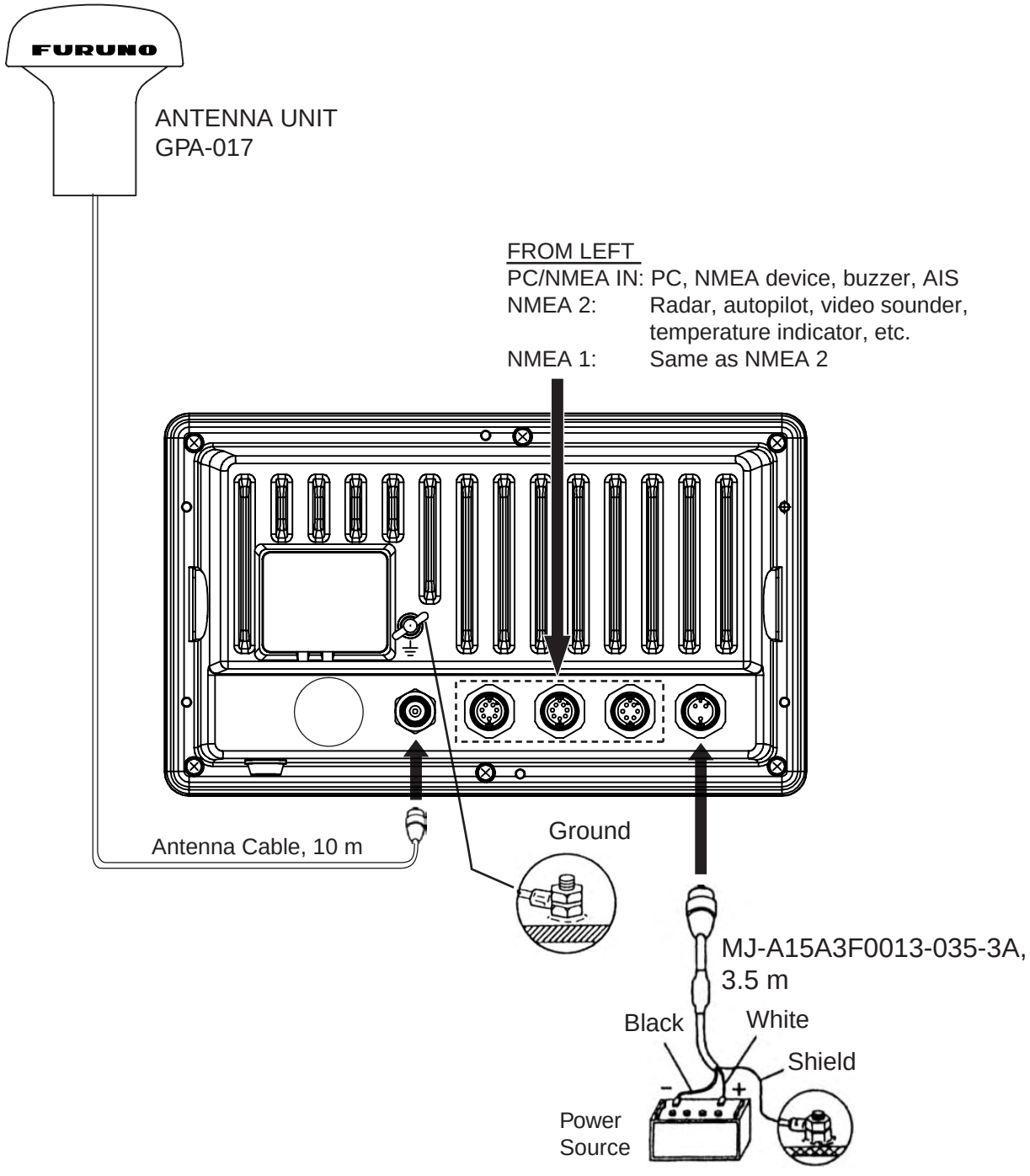
Note: If the antenna cable is to be passed through a hole in a bulkhead which is too small to pass the connector, disassemble the connector with radio pincers and a monkey wrench. After passing the cable through the hole assemble the connector as below.



How to assemble the antenna connector

2. WIRING

The figure below shows the basic wiring scheme.



Display unit, rear view

Power source

The power source is a 12-24 VDC battery. Be sure the power cable is tightly fastened to the power source and the polarity (plus and minus) is correct. Connect the white lead to the positive terminal (+) and the black lead to the negative terminal (-).

Ground

Connect the ground wire to the boat's grounding bus. If the unit is not grounded, noise may result. If noise is a problem on an FRP vessel, fasten a ground plate of 20 cm x 30 cm to the outside of the ship's hull and connect the ground wire there.

Use a closed-type lug ( ) for the connection on the display unit. Do not use an open-type lug ( ).

Antenna cable

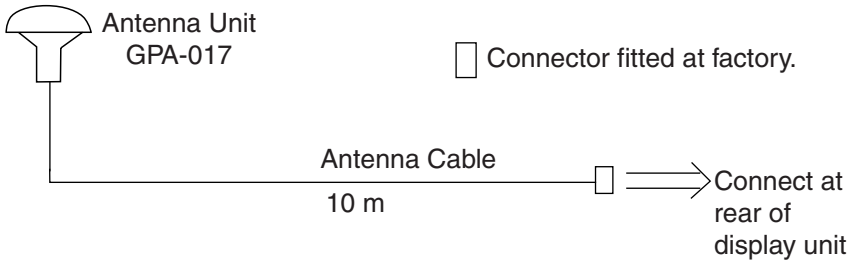
Types of antenna cables

If a longer length of antenna cable is required, use the optional antenna cable set, which is available in 30 and 50 m lengths.

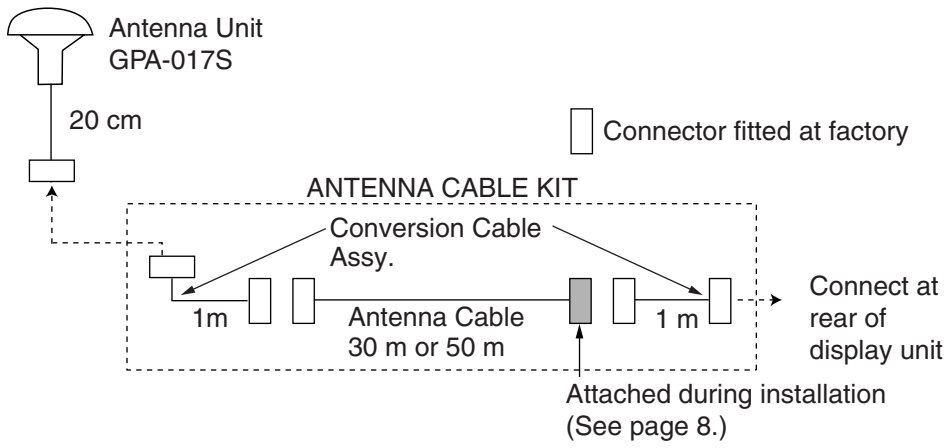
Antenna cable set

Antenna cable set	Code no.	Contents
CP20-01700	004-372-110	1) Converter cable assy. NJ-T-3DX-1, Code No. 000-123 2) Vinyl tape NO.360 Code No. 000-835-215 3) Connector N-P-8DFB-CF, Code No. 000-156-918-10 4) Self-bonding tape U-tape, Code No. 000-165-833-10 5) Antenna cable assy. 8D-FB-CV*30m*, Code No. 000-117-547
CP20-01710	004-372-120	Items 1) - 4) above plus: Antenna cable assy. 8D-FB-CV*50m*, Code No. 000-117-549

Connecting the antenna cable



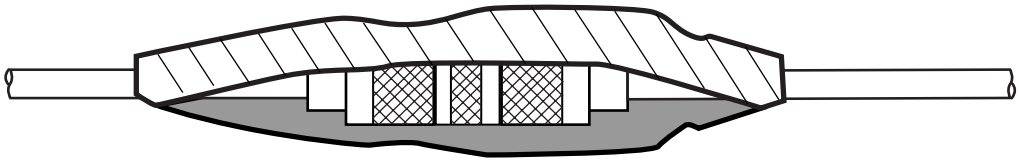
Connection of antenna unit GPA-017



Connection of antenna cable set on antenna unit GPA-017S (option)

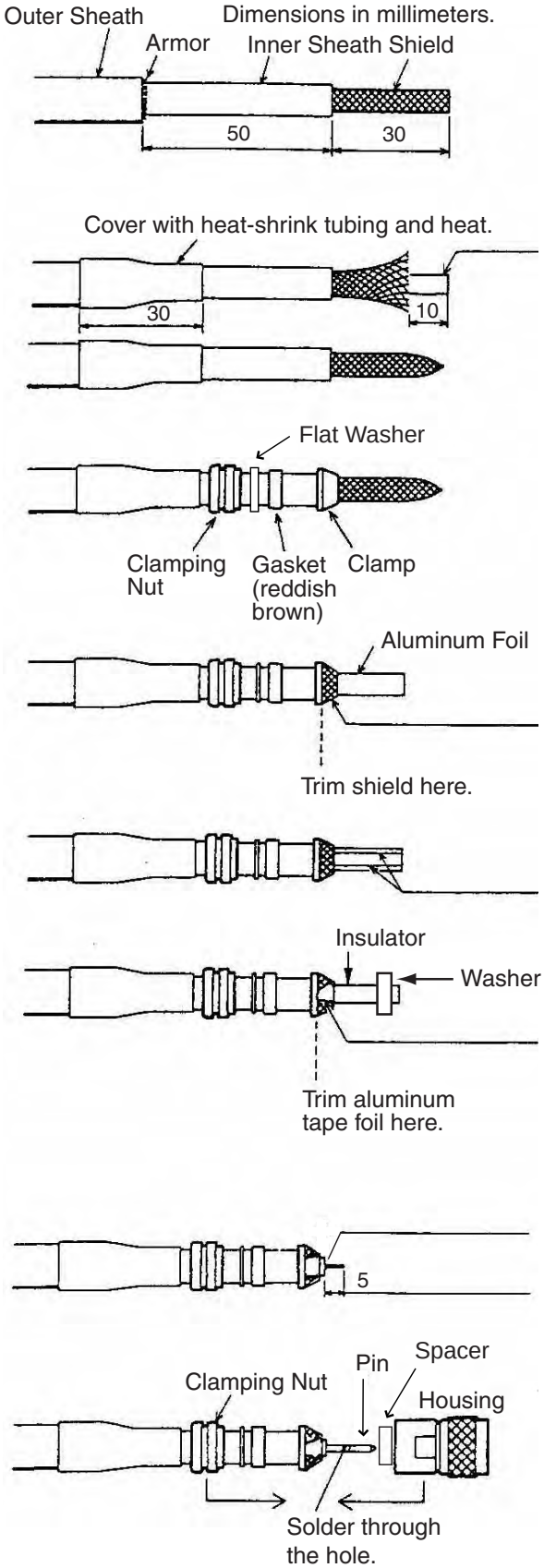
Waterproofing the connector

If you are using the extension cable, connect the cable and then wrap the connector with self-vulcanizing tape and then vinyl tape to waterproof it. Bind ends of vinyl tape with cable ties (local supply) to prevent unraveling.



How to waterproof the connector

How to attach N-P-8DFB connector (for extension cable kit)



Remove outer sheath and armor by the dimensions shown left.
Expose inner sheath and shield by the dimensions shown left.

Cut off insulator and core by 10 mm.

Twist shield end.

Slip on clamping nut, flat washer, gasket and clamp as shown left.

Fold back shield over clamp and trim.

Cut aluminum foil at four places, 90° from one another.

Fold back aluminum foil onto shield and trim.

Remove insulator up to edge of washer 2.

Expose the core by 5 mm.

Slip the pin onto the conductor. Solder them together through the hole on the pin.

Insert the spacer and housing. Screw the clamping nut into the housing.
(Tighten by turning the clamping nut. Do not tighten by turning the housing.)

How to attach N-P-8DFB connector

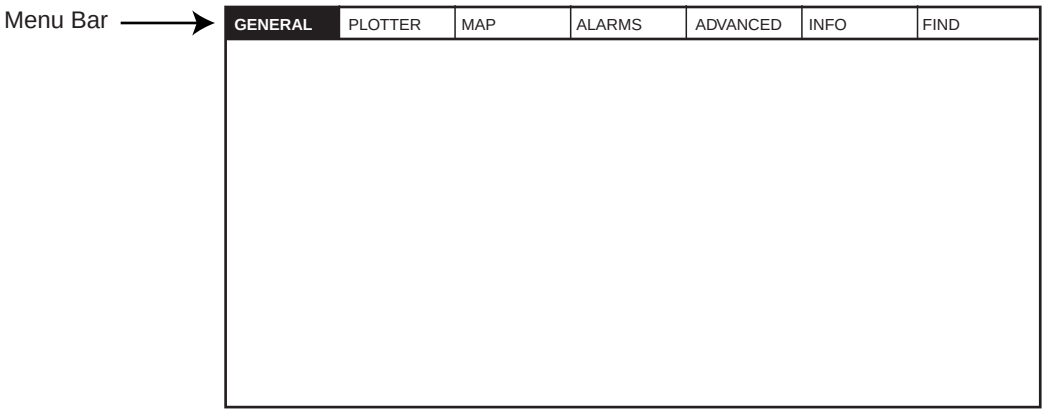
3. ADJUSTMENTS

This chapter shows you how to adjust your unit, from the menu. When choosing item or option from the menu, you may use the [ENTER] knob or the CursorPad ( ). For sake of brevity the descriptions contained herein use the [ENTER] knob.

3.1 Choosing Position Data Source

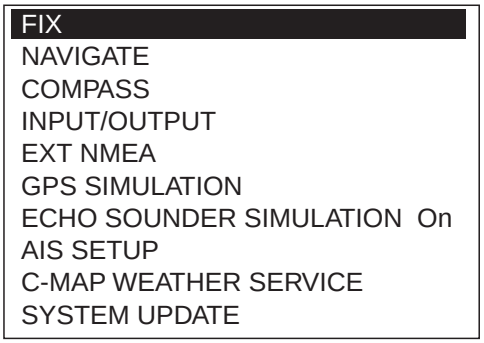
If you intend to use a position data from a source other than the internal GPS receiver follow the procedure below. Otherwise, go to paragraph 3.2.

1. Press the [MENU] key to show the menu bar.



Menu bar

2. Rotate the [ENTER] knob to choose ADVANCED from the menu bar and then push the [ENTER] knob.



ADVANCED menu

3. Rotate the [ENTER] knob to choose INPUT/OUTPUT and then push the [ENTER] knob.

INTERNAL GPS SETUP	
NMEA 1 INPUT	NMEA-0183 4800-N81-N
NMEA 1 OUTPUT	
NMEA 2 INPUT	NMEA-0183 4800-N81-N
NMEA 2 OUTPUT	
RS232/NMEA 3 INPUT	NMEA-0183 4800-N81-N
RS232C 3 OUTPUT	
INPUT 3 MODE	RS232C
WPL/RTE FORMAT	Standard
EXTERNAL EVENT	Off
C-LINK	Off

INPUT/OUTPUT menu

4. Rotate the [ENTER] knob to choose INTERNAL GPS SETUP and then push the [ENTER] knob.

RESTART GPS	
INTERNAL GPS	On
DIFF CORR SOURCE	WAAS
WAAS SEARCH	Auto

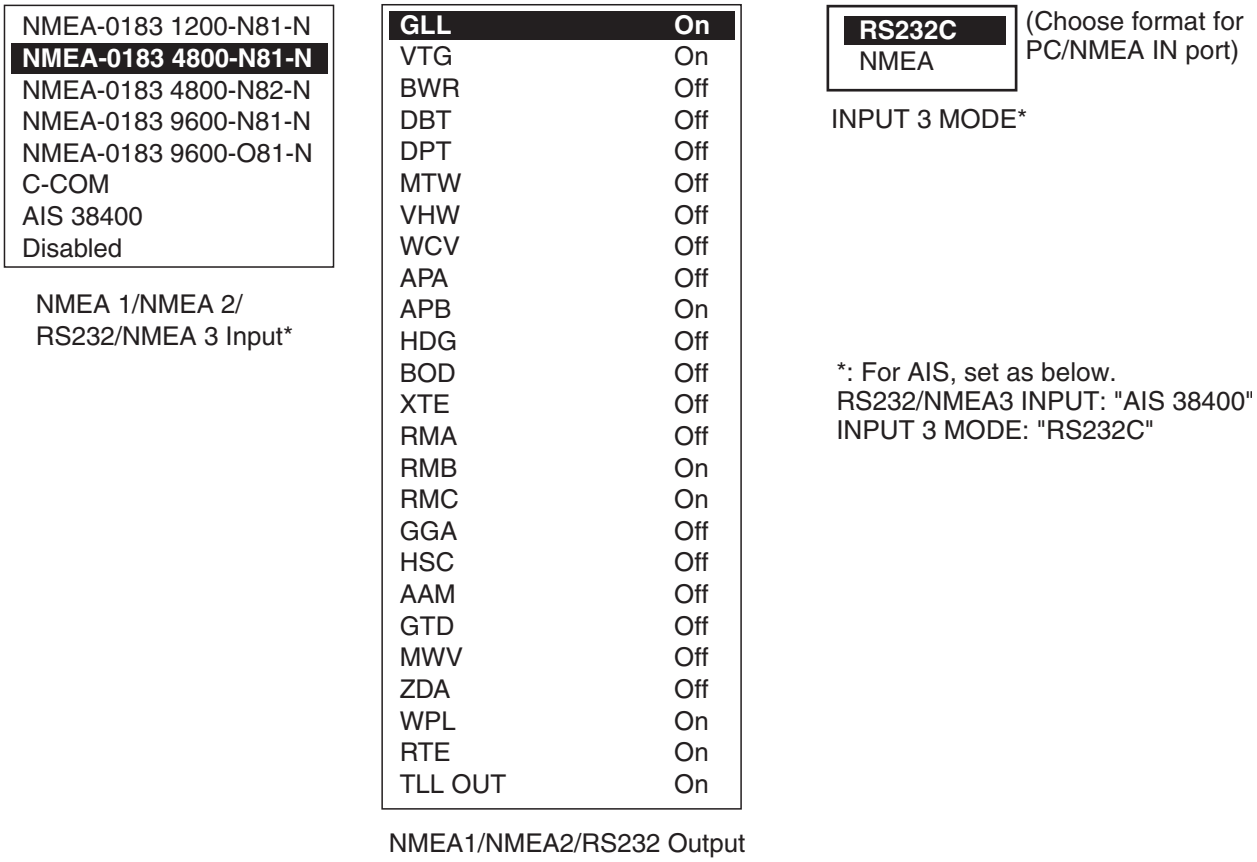
INTERNAL GPS SETUP menu

5. Rotate the [ENTER] knob to choose INTERNAL GPS and then push the [ENTER] knob.

6. Rotate the [ENTER] knob to choose Off or On and then push the [ENTER] knob.
   Off: Use external navigator
   On: Use internal GPS navigator
7. Press the [MENU] key to close all open windows and erase the menu bar.

3.2 Choosing Port I/O Format

1. Press the [MENU] key to show the menu bar.
2. Rotate the [ENTER] knob to choose ADVANCED from the menu bar and then push the [ENTER] knob.
3. Rotate the [ENTER] knob to choose INPUT/OUTPUT and then push the [ENTER] knob.
4. Rotate the [ENTER] knob to choose appropriate INPUT or OUTPUT item and then push the [ENTER] knob.



NMEA 1 INPUT, NMEA 1 OUTPUT menus

5. Do one of the following depending on item selected.

Input

1) Rotate the [ENTER] knob to choose appropriate option and then push the [ENTER] knob. Below is the meaning of the NMEA options. "C-COM" is for connection of a GSM modem. For details about the GSM modem, see its owner's manual.

NMEA-0183 4800-N81-N
① ② ③④⑤ ⑥

① Data format
② Baud rate: 1200, 4800, 9600(bps)
③ Parity: N (No parity) or O (Odd parity)
④ Character length (8)
⑤ Stop bit: 1 or 2
⑥ X-On/Off (non)

Description of NMEA options

2) Press ◀ to close the window.

Output

1) Rotate the [ENTER] knob to choose appropriate option and then push the [ENTER] knob.

2) Rotate the [ENTER] knob to choose Off or On as appropriate and then push the [ENTER] knob followed by ◀.

6. Repeat step 5 to set up other ports.
7. Press the [MENU] key to close all open windows and erase the menu bar.

I/O format

	Port	I/O format	Data sentence	Remarks
Input	NMEA 1, NMEA 2	IEC-61162-1, NMEA-0183 Ver. 1.5/2.0/3.0	See table below.	
	PC/NMEA IN	RS232, and IEC and NMEA above	For NMEA IN, see table below.	
Output	NMEA 1, NMEA 2	IEC-61162-1, NMEA-0183 Ver. 1.5/2.0/3.0	GLL, VTG, BWR, DBT, DPT, MTW, VHW, WCV, APA, APB, HDG, BOD, XTE, RMA, RMB, RMC, GGA, HSC, WPL, RTE, TLL, AAM, GTD, MWV, ZDA	BWR: Rhumb line
	PC/NMEA IN	RS232		

Input data, sentence priority

Data	Sentence priority order	Remarks
Speed thru water	VHW	
True heading	HDT, HDG, HDM	
Magnetic heading	HDT, HDG, HDM	
Target position	TLL	
Radiotelephone target position	DSC, DSE	
Waypoint data	RMB	
Depth	DPT, DBT	
Water temperature	MTW	
Wind current, speed	MWV	

3.3 Calibrating NMEA Depth, Speed and Water Temperature Data

NMEA speed, depth and water temperature data may be corrected from the GP-7000 if they cannot be done from the equipment that outputs the data. Enter a minus value if the actual value is lower than the NMEA data, or a plus value if the actual value is higher than the NMEA data. For example, if the actual water temperature is 20° and the water temperature data output by the sensor is 17°, enter +3(°).

1. Press the [MENU] key to show the menu bar.
2. Rotate the [ENTER] knob to choose ADVANCED from the menu bar and then push the [ENTER] knob.
3. Rotate the [ENTER] knob to choose EXT NMEA and then push the [ENTER] knob.

EXT NMEA menu

4. Rotate the [ENTER] knob to choose appropriate item.

   DRAFT SETUP: Enter ship's draft to get NMEA depth from sea surface (instead of transducer).
   SPEED CALIBRATION: Enter offset in percentage points to correct NMEA speed indication.
   TEMP CALIBRATION: Enter offset to correct NMEA water temperature indication.
5. Push the [ENTER] knob. The cursor is selecting the plus sign (or minus sign). If it is necessary to switch from plus to minus or vice versa, rotate the [ENTER] knob to choose plus or minus and then push the [ENTER] knob. If not necessary, go to step 6.
6. Push the [ENTER] knob, rotate the [ENTER] knob to set digit and then push the [ENTER] knob. To clear a line of data, press the [CLR FLD] soft key, which is the third key from the left of the keys below the screen.

   Setting range
   Draft setup: -20 - +39.9(ft)
   Speed calibration: -50 - +50(%)
   Temp calibration: -50 - +50(°F)
7. Set other digits as you did in step 6.
8. Press the [SAVE] soft key, which is the fourth key from the left of the keys below the screen.
9. If necessary, repeat step 4-8 to choose and set another calibration item.
10. Press the [MENU] key to close all open windows and erase the menu bar.

3.4 Waypoint, Route Format

You may transfer waypoint and route data to another GP-7000 series unit or a PC in Standard or Furuno format, via the NMEA1 port, NMEA2 port or PC NMEA IN port.

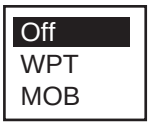
1. Press the [MENU] key to show the menu bar.
2. Rotate the [ENTER] knob to choose ADVANCED from the menu bar and then push the [ENTER] knob.
3. Rotate the [ENTER] knob to choose INPUT/OUTPUT and then push the [ENTER] knob.
4. Rotate the [ENTER] knob to choose WPL/RTE FORMAT and then push the [ENTER] knob.

5. Choose Furuno or Standard as appropriate and then push the [ENTER] knob.
   Standard: NMEA format WPL and RTE sentences are output when "SEND" is executed to transfer waypoint list or route list.
   Furuno: Furuno format WPL and RTE sentences are output when "SEND" is executed to transfer waypoint list or route list. Waypoint color, shape and comment data are sent.
6. Press the [MENU] key to close the menu.

3.5 External Event Format

If the equipment is equipped with an external event switch you may choose what mark is inscribed on the screen when the switch is pressed. For connection of an external event switch, see the interconnection diagram.

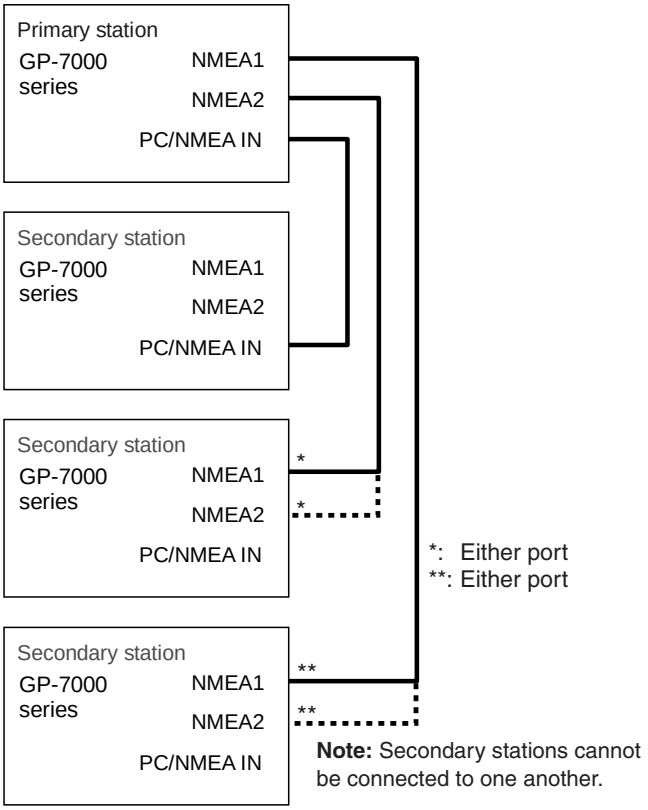
1. Press the [MENU] key to show the menu bar.
2. Rotate the [ENTER] knob to choose ADVANCED from the menu bar and then push the [ENTER] knob.
3. Rotate the [ENTER] knob to choose INPUT/OUTPUT and then push the [ENTER] knob.
4. Rotate the [ENTER] knob to choose EXTERNAL EVENT and then push the [ENTER] knob.



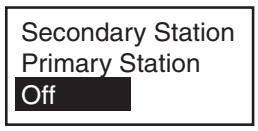
5. Choose Off, WPT or MOB as appropriate and then push the [ENTER] knob.
   Off: No event switch is connected.
   WPT: Waypoint is registered at ship's position if the cursor is not displayed, or at cursor position if the cursor is displayed.
   MOB: MOB is registered at ship's position.
6. Press the [MENU] key to close the menu.

3.6 C-link (primary and secondary stations)

The C-link feature, available when several GP-7000 series units are interconnected via NMEA ports or PC/NMEA IN ports (see the illustration below), lets you duplicate on secondary stations the destination set at the primary station. With this feature active destination may only be set from the primary station.



1. Press the [MENU] key to show the menu bar.
2. Rotate the [ENTER] knob to choose ADVANCED from the menu bar and then push the [ENTER] knob.
3. Rotate the [ENTER] knob to choose INPUT/OUTPUT and then push the [ENTER] knob.
4. Rotate the [ENTER] knob to choose C-LINK and then push the [ENTER] knob.



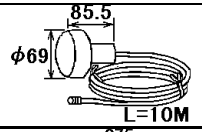
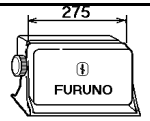
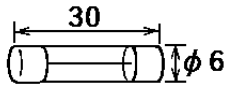
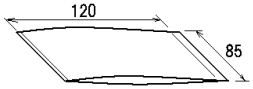
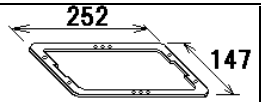
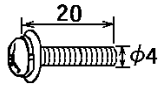
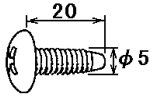
5. Choose Secondary Station, Primary Station or Off as appropriate and then push the [ENTER] knob.

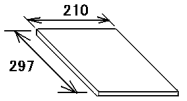
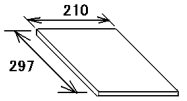
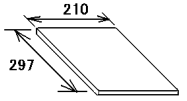
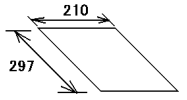
   Secondary Station: This unit is designated as the secondary station. Destination cannot be set or changed from the secondary station.
   Primary Station: This unit is designated as the primary station.
   Off: C-link feature is turned off.

   Note: When three or more units are installed, designate only one unit as the primary station. All other units should be designated as secondary stations. If you designate two units as primary units, the message “Both chart plotters are set as Primary station” appears and the buzzer sounds.

6. Press the [MENU] key to close the menu.

PACKING LIST GP-7000/F-E-C-017,GP-7000/F-E-N-017

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線部 ANTENNA UNIT		GPA-017 000-041-403-00	1
指示器 DISPLAY UNIT		GP-7000-E-C 000-041-184-00 **	1
予備品 SPARE PARTS			**SP14-03201**
ﾋｭｰｽﾞ FUSE		FGBO-A 125V 3A PBF FGBO-A 3A AC125V 000-155-850-10 000-549-063-00	1
付属品 ACCESSORIES			**FP20-01100**
ﾌｨﾙﾀｰｸﾘｰﾅｰ FILTER CLEANER		02-155-1082-1 100-332-651-10	1
工事材料 INSTALLATION MATERIALS			**CP14-06400**
Fﾏｳﾝﾄﾖｳｽﾎﾟﾝｼﾞ FLUSH MOUNTING SPONGE		14-074-1032-0 100-323-890-00	1
+ﾅﾍﾞｾﾑｽﾈｼﾞB WASHER HEAD SCREW		M4X20 SUS304 M4X20 SUS304 000-162-652-10 000-804-742-00	6
+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1ｼｭ SELF-TAPPING SCREW		5X20 SUS304 5X20 SUS304 000-162-608-10 000-802-081-00	4

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ｹｰﾌﾞﾙ組品MJ SIGNAL CABLE ASSEMBLY		MJ-A6SPF0003-050C 000-154-054-10	1
ｹｰﾌﾞﾙ組品MJ POWER CABLE		MJ-A15A3F0013-035-3A 000-145-880-00	1
図書 DOCUMENT			
装備要領書 INSTALLATION MANUAL		IM*-44290-* 000-149-136-1* **	1
操作要領書(英) OPERATOR'S GUIDE		OS*-44290-* 000-149-135-1* **	1
取扱説明書 OPERATOR'S MANUAL		OM*-44290-* 000-149-134-1* **	1
ﾌﾗｯｼｭﾏｳﾝﾄ型紙 TEMPLATE		E42-00401-* 000-149-985-1*	1

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表型式/ｺｰﾄﾞを表します。
CODE NUMBER ENDED BY "**" INDICATES THE NUMBER OF TYPICAL MATERIAL.

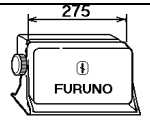
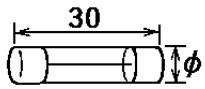
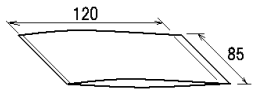
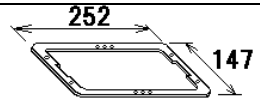
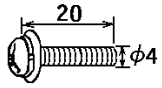
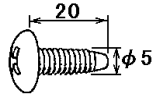
A-1

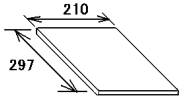
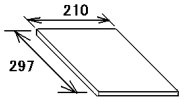
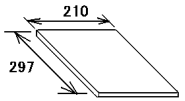
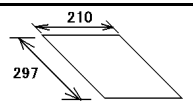
型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

PACKING LIST GP-7000/F-E-C, GP-7000/F-E-N

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
指示器 DISPLAY UNIT		GP-7000-E-C 000-041-184-00 **	1
予備品 SPARE PARTS		**SP14-03201**	
ﾋｭｰｽﾞ FUSE		FGBO-A 125V 3A PBF FGBO-A 3A AC125V 000-155-850-10 000-549-063-00	1
付属品 ACCESSORIES		**FP20-01100**	
ﾌｲﾙﾀｰｸﾘｰﾅｰ FILTER CLEANER		02-155-1082-1 100-332-651-10	1
工事材料 INSTALLATION MATERIALS		**CP14-06400**	
Fﾏｳﾝﾄﾖｳｽﾎﾟﾝｼﾞ FLUSH MOUNTING SPONGE		14-074-1032-0 100-323-890-00	1
+ﾅﾍﾞ ｾﾑｽﾈｼﾞB WASHER HEAD SCREW		M4X20 SUS304 M4X20 SUS304 000-162-652-10 000-804-742-00	6
+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1ｼｭ SELF-TAPPING SCREW		5X20 SUS304 5X20 SUS304 000-162-608-10 000-802-081-00	4
ｹｰﾌﾞﾙ組品MJ SIGNAL CABLE ASSEMBLY		MJ-A6SPF0003-050C 000-154-054-10	1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ｹｰﾌﾞﾙ組品MJ POWER CABLE		MJ-A15A3F0013-035-3A 000-145-880-00	1
図書 DOCUMENT			
装備要領書 INSTALLATION MANUAL		IM*-44290-* 000-149-136-1* **	1
操作要領書(英) OPERATOR'S GUIDE		OS*-44290-* 000-149-135-1* **	1
取扱説明書 OPERATOR'S MANUAL		OM*-44290-* 000-149-134-1* **	1
ﾌﾗｯｼｭﾏｳﾝﾄ型紙 TEMPLATE		E42-00401-* 000-149-985-1*	1

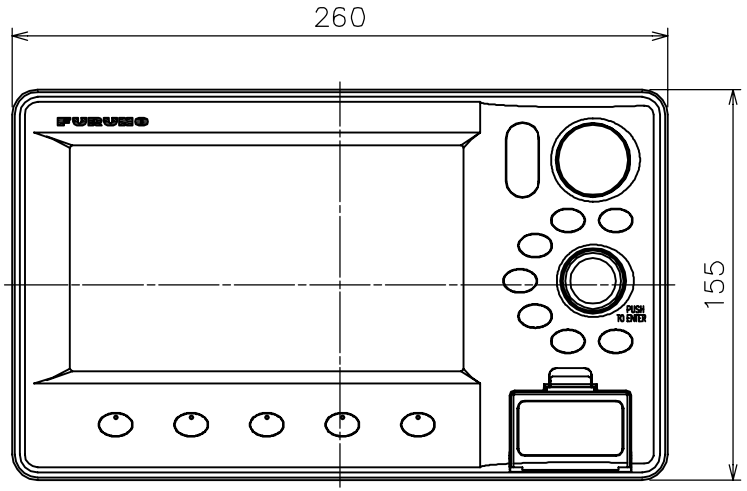
1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表型式/ｺｰﾄﾞを表します。
CODE NUMBER ENDED BY "**" INDICATES THE NUMBER OF TYPICAL MATERIAL.

(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

FURUNO



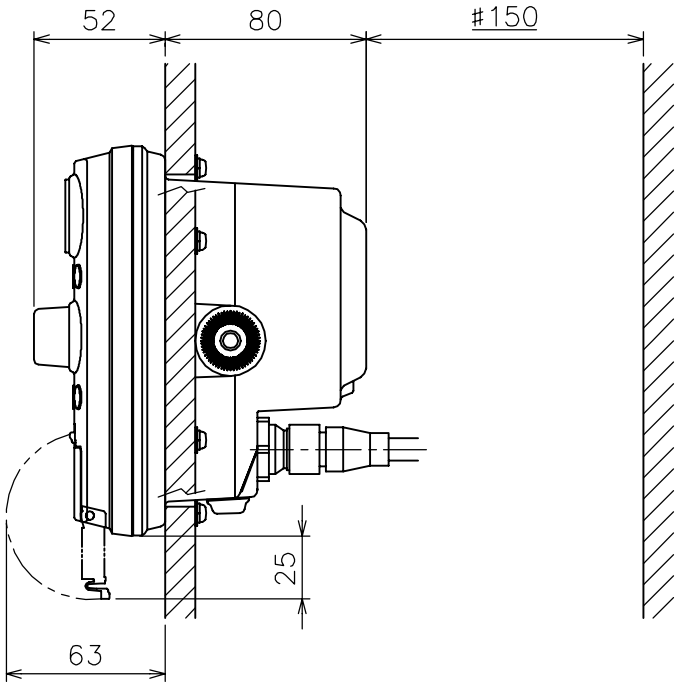
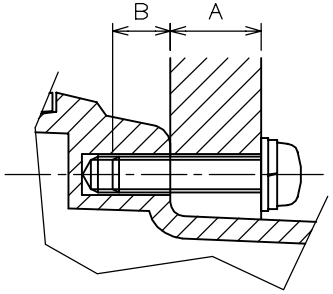


表1 TABLE 1

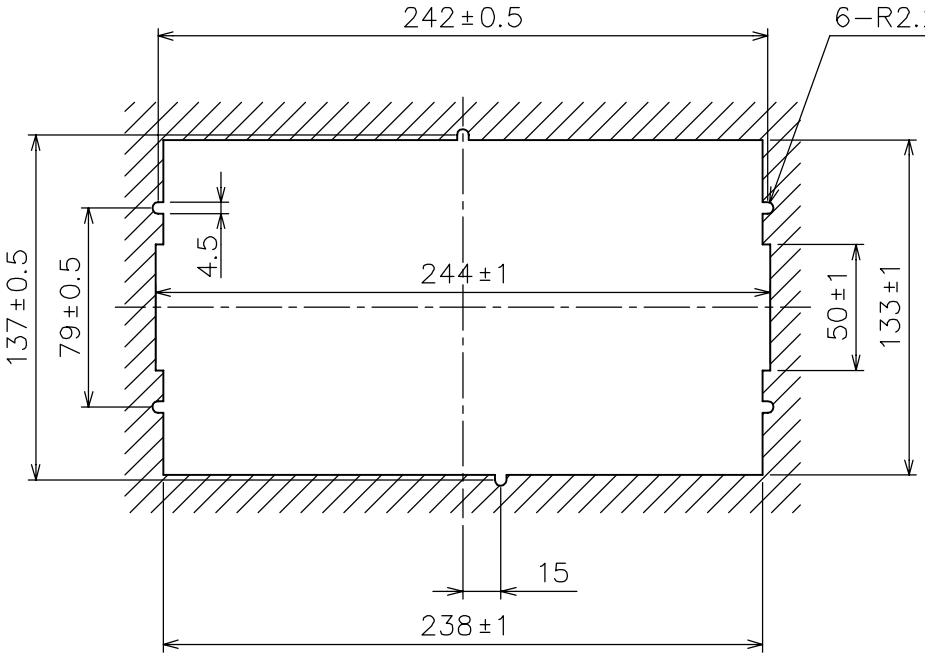
寸法区分（mm） DIMENSIONS	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3



取付ネジ部断面（尺度1／1）
DETAIL FOR FIXING (SCALE: 1/1)

表2 TABLE 2

機種名 MODEL NAME	質量 MASS
GP-7000 GP-7000-N	2.2Kg
GP-7000F GP-7000F-N	2.3Kg



注　記
1）装備ケーブルはサービス時、指示部を前方に十分引き出せるよう余裕を持たせること。
2）取付用ネジは、セムスネジB M4X20を使用のこと。
壁の厚さ（A）は最小11 最大14とする。
上記以外の壁に装備する場合、使用するネジの長さは（A+7．3）±1．5とする。（セムスネジBを使用）
筐体にはネジ部を7mm以上入れないこと。（B=MAX．7）
3）指定外寸法公差は、表1による。
4）＃印寸法は最小サービス空間とする。

NOTE
1. LEAVE ENOUGH SLACK IN CABLING SO UNIT CAN BE DRAWN FORWARD WITHOUT DISCONNECTING CABLING.
2. FOR FIXING, USE M4X20 SCREWS WHERE THICKNESS (A) OF PANEL IS 11–14 MM.
FOR THICKER PANEL, LENGTH OF SCREW SHALL BE (A+7.3) ±1.5.
THE MAX. LENGTH OF (B) SHALL BE 7 mm.
3. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
4. #: MINIMUM SERVICE CLEARANCE.

DRAWN	Juy 12, '05 E. MIYOSHI	TITLE	GP-7000/F
CHECKED	TAKAHASHI. T	名称	指示器（埋込装備）
APPROVED	Y. Hatai		外寸図
SCALE	1/3	MASS	TABLE 2 ±10% 約2個 kg
DWG No.	C4429-G01-C	REF No.	14-074-110G-3
NAME	DISPLAY UNIT (FLUSH MOUNT)		OUTLINE DRAWING

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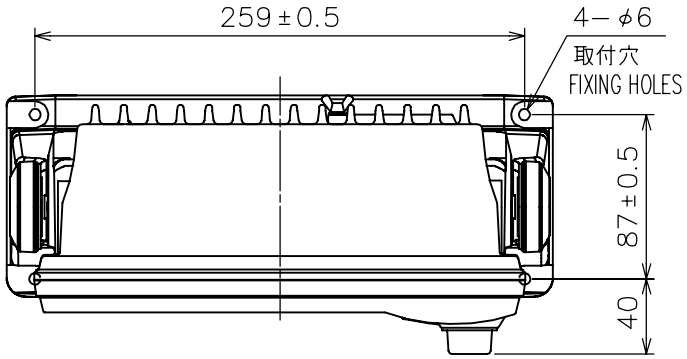

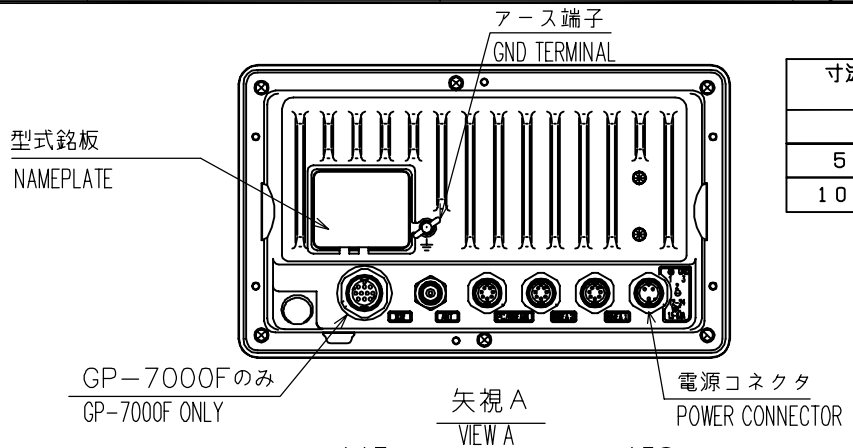

表1 TABLE 1

寸法区分（mm） DIMENSIONS	公差（mm） TOLERANCE
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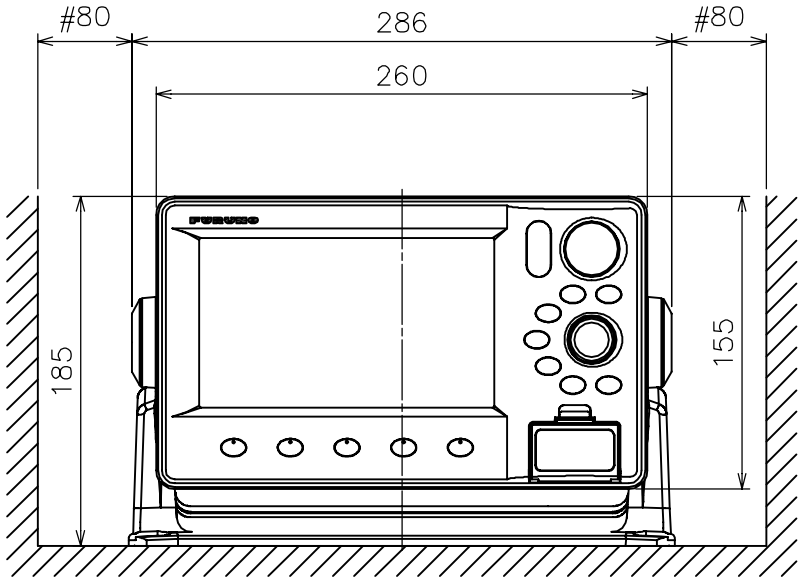
50<L≦100	±2.5
100<L≦500	±3



矢視A
VIEW A

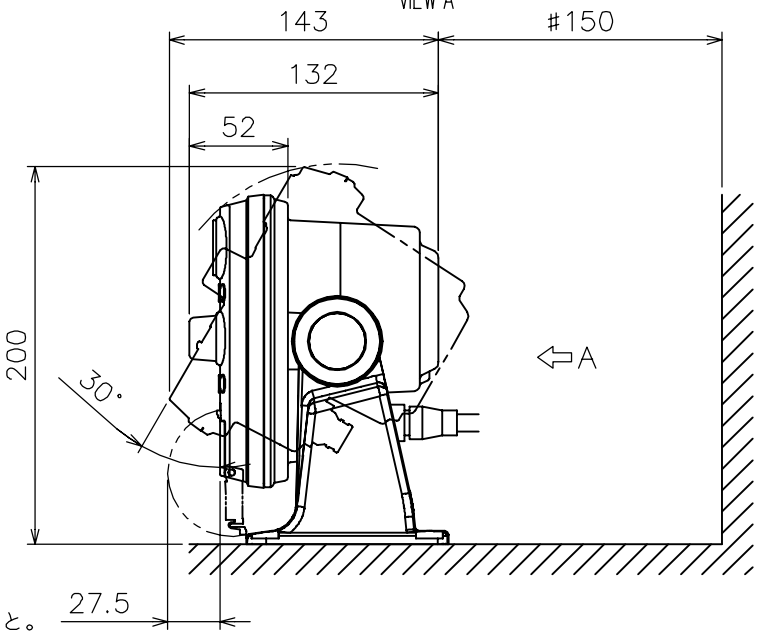


表2 TABLE 2

機種名 NODEL NAME	質量 MASS
GP-7000 GP-7000-N	2.5Kg
GP-7000F GP-7000F-N	2.6Kg

注　記
1）装備ケーブルはサービス時、指示部を前方に十分引き出せるよう余裕を持たせること。
2）取付用ネジはトラスタッピングネジ呼び径５ｘ２０を使用のこと。
3）指定外の寸法公差は表１による。
4）＃印寸法は最小サービス空間寸法とする。

NOTE
1. LEAVE ENOUGH SLACK IN CABLING SO UNIT CAN BE DRAWN FORWARD WITHOUT DISCONNECTING CABLING.
2. USE SELF-TAPPING SCREWS 5X20 FOR FIXING THE UNIT.
3. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
4. #: MINIMUM SERVICE CLEARANCE.

DRAWN Jul 12,'05 E. MIYOSHI		TITLE	GP-7000/F
CHECKED TAKAHASHI. T		名称	指示器（卓上装備）
APPROVED Y. Hatai			外寸図
SCALE 1/4 MASS TABLE 2 ±10% 表2参照 kg		NAME	DISPLAY UNIT (DESKTOP MOUNT)
DWG No. C4429-G02-C	REF No. 14-074-100G-3		OUTLINE DRAWING

D-2

FURUNO ELECTRIC CO., LTD.

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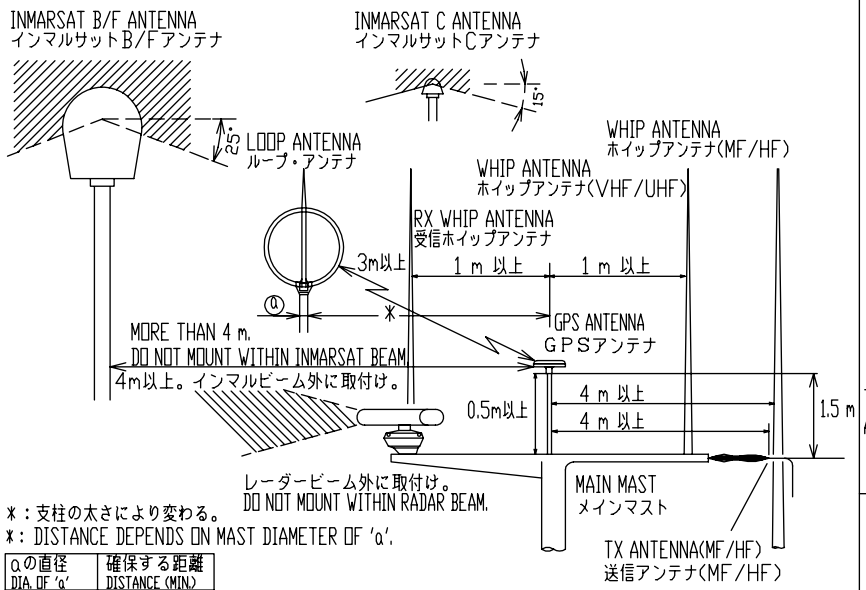
取付位置
MOUNTING LOCATION

他の機器のアンテナから下の図の距離以上離す。
THIS FIGURE SHOWS THE SEPARATION DISTANCES FROM OTHER ANTENNAS TO AVOID MUTUAL INTERFERENCE.



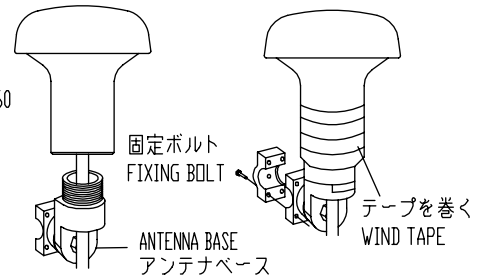
*：支柱の太さにより変わる。
*: DISTANCE DEPENDS ON MAST DIAMETER OF 'a'.

aの直径 DIA. OF 'a'	確保する距離 DISTANCE (MIN)
10 cm	1.5 m
30 cm	3 m

B）スタンションやパルピットにつけるとき
レール用アンテナベース No.13-RC5160
（取付可能レール直径：ø19~ø32）
（コード番号：000-806-114）

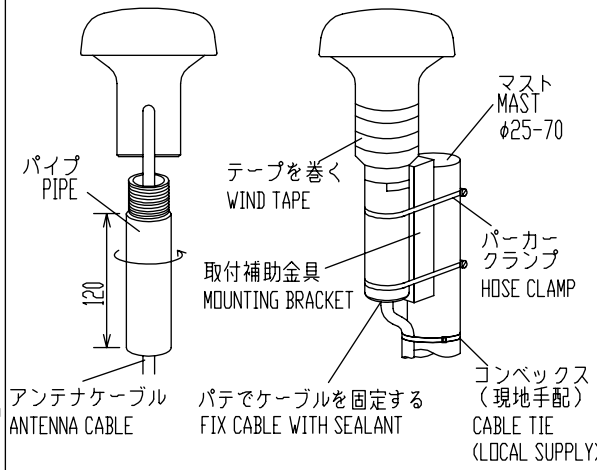
HANDRAIL MOUNTING

USE HANDRAIL MOUNTING BASE No.13-RC5160 (CODE No.000-806-114, OPTION).
THE DIAMETER OF THE HANDRAIL MAY BE FROM ø19mm TO ø32mm.

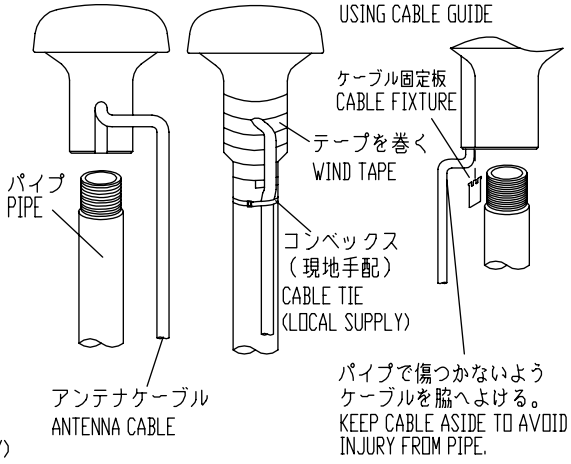


A）マストへの取付け
MAST MOUNTING

a)マスト取付金具CP20-01111(工事材料)でマストに固定する。
USE MAST MOUNTING KIT CP20-01111.

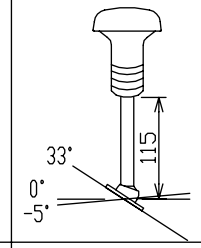
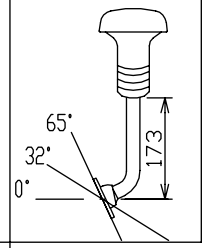
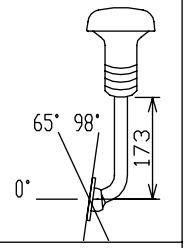


b)パイプのみを使うとき
USE A PIPE ONLY.

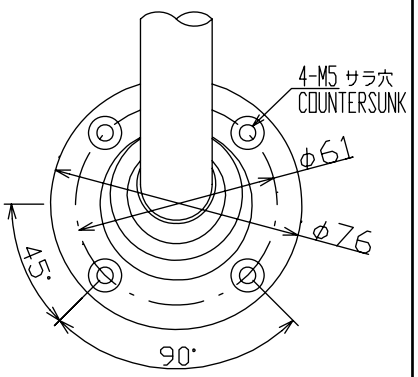


C）取付ける場所が傾斜しているとき
ANTENNA BASE MOUNTING

オプションのアンテナベースを使う。
USE OPTIONAL ANTENNA BASE.

傾斜 INCLINATION	-5° - 33°	32° - 65°	65° - 98°
装備方法 MOUNTING METHOD			
アンテナベース型式 ANT. BASE TYPE コード番号 CODE No.	直型アンテナベース RIGHT ANGLE ANTENNA BASE No.13-QA330 000-803-239	L型アンテナベース L-TYPE ANTENNA BASE No.13-QA310 000-803-240	

アンテナベース基部
MOUNTING DIMENSIONS OF ANTENNA BASE.



注記 1）パイプやアンテナベースはアンテナユニットにねじ込んだ後に固定する。
2）アンテナを固定するときはパイプ（アンテナベース）をアンテナにねじ込むこと。
アンテナ側をねじるとコネクタ部やケーブルに無理がかかり、故障の原因となる。

NOTE 1. FASTEN PIPE(ANTENNA BASE) TO ANTENNA UNIT FIRST THEN FIX THEM TO MAST OR HANDRAIL.
2. WHEN FIXING ANTENNA, TURN PIPE OR ANTENNA BASE; NOT THE ANTENNA.
TURNING THE ANTENNA MAY TWIST THE CABLE AND PLACE STRESS ON CONNECTOR.

DRAWN	Dec. 14, '05 E.MIYOSHI	TITLE	GPA series
CHECKED	TAKAHASHI.T	名称	空中線部
APPROVED	Y. Hatai		装備要領図
SCALE	MASS	NAME	ANTENNA UNIT
DWG.No.	C4384-Y01- E		INSTALLATION PROCEDURE

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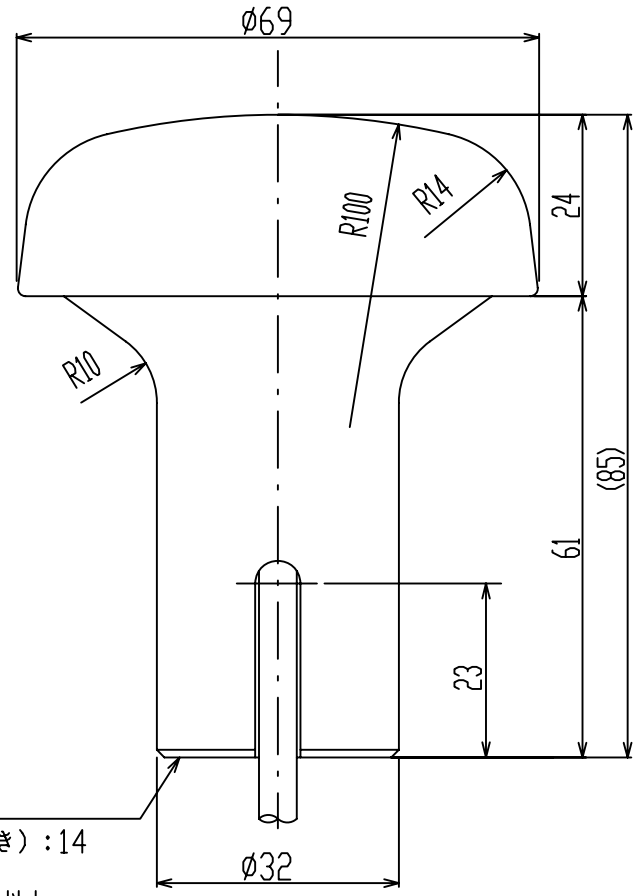
表1 TABLE 1

寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
L ≦ 50	±1.5
50 < L ≦ 100	±2.5
100 < L ≦ 500	±3



1-14UNS1B
ねじ山数（25.4mmにつき）：14
ピッチ： 1.8143 mm
オネジ有効長さ：19 mm以上
オネジ有効径：24.17mm

THREAD PER 25.4mm (1 INCH): 14
PITCH: 1.8143 mm
THREAD LENGTH: 19 mm OR MORE
PITCH DIAMETER: 24.17mm

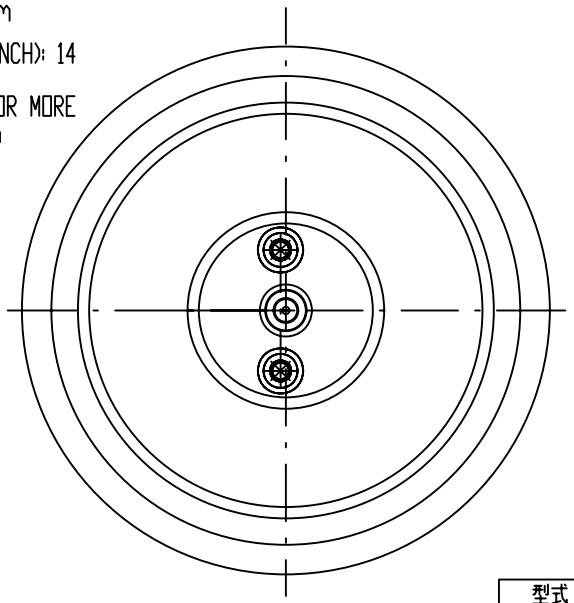


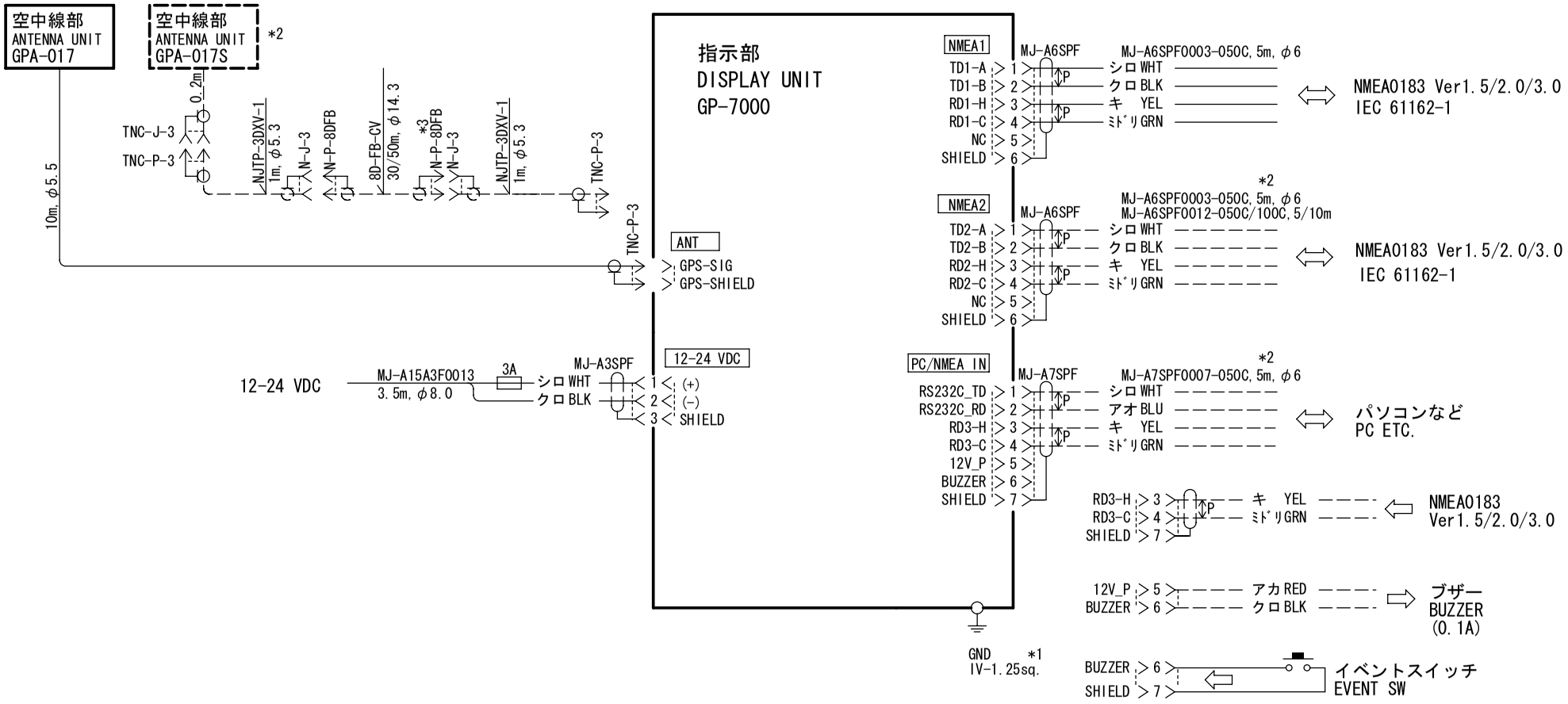
表2 TABLE 2

型式 TYPE	ケーブル長(m) CABLE LENGTH	プラグ PLAG	質量(kg±10%) MASS
GPA-017	10	TNC-P-3	0.6
GPA-017S	0.2	TNC-J-3	0.15

注記
指定外の寸法公差は表1による。

NOTE
TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

DRAWN Mar. 27 '07 T.YAMASAKI		TITLE GPA-017/017S
CHECKED Mar. 27 '07 T.TAKENO		名称 空中線部
APPROVED Mar,27'07 R.Esumi		外寸図
SCALE 1/1 MASS TABLE 2 表2参照		NAME ANTENNA UNIT
DWG.No. C4384-G04- L		OUTLINE DRAWING



注記
＊１）造船所手配。
＊２）オプション。
＊３）コネクタは現地にて取付け。

NOTE
*1. SHIPYARD SUPPLY
*2. OPTION
*3. ATTACH CONNECTOR LOCALLY.

DRAWN MAY 8, '06 E. MIYOSHI		TITLE	GP-7000
CHECKED TAKAHASHI.T		名称	カラーGPSプロッタ
APPROVED Y. Hatai			相互結線図
SCALE / MASS kg		NAME	COLOR GPS PLOTTER
DWG No. C4429-C01- F	REF No. 14-074-5000		INTERCONNECTION DIAGRAM

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S-1

ECF
(Elemental Chlorine Free)
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is elemental chlorine free.

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